

Pushing and Braking Aid

V-max

User's Manual



Ideen bewegen mehr



CE Declaration of conformity

The company AAT Alber Antriebstechnik GmbH herewith declares that the products of the power system **V-max** are developed and manufactured according to the general guidelines 93/42/EEG of the European Union.

This declaration loses all validity, if the above mentioned devices have been tampered with or changed in any way without the knowledge and agreement of the company AAT Alber Antriebstechnik.



Signature of the manufacturer:

Markus Alber
Managing partner

AAT Alber Antriebstechnik
GmbH

The power system **V-max** is being tested according to the norm DIN EN



12184:C11/99 at the institution for
certification of medical products GmbH,
Technical University Berlin.



AAT Alber Antriebstechnik GmbH

P.O. Box 10 05 60 · D-72426 Albstadt
Tel.: +49 - 74 31 - 12 95 0 · Fax.: +49 - 74 31 - 12 95 35
info@aat-online.de · www.aat-online.de

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1 Introduction

V-max is a newly developed pushing and braking aid operated by an assistant. The device directly propels the back wheels of a wheelchair.

Compared to common power systems the **V-max** possesses considerable advantages such as e.g. a permanent and efficient power transmission.



1.1 Product description

1.1.1 Main features

Ê = Control grip

Ë = Driving unit

Ì = Wheels plus handrim and toothed ring

Í = Brackets on the wheelchair

Î = Anti-tilt support

Ï = Battery pack plus bag and Velcro strip

Ð = Pushing grip



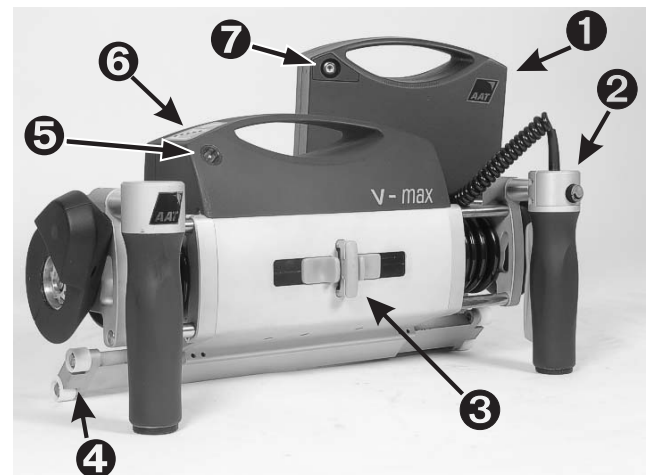
1.1.2 Control grip

- ❶ = Speed control
- ❷ = Rocker switch backwards/forwards
- ❸ = Link to hold grips
- ❹ = Helix cable



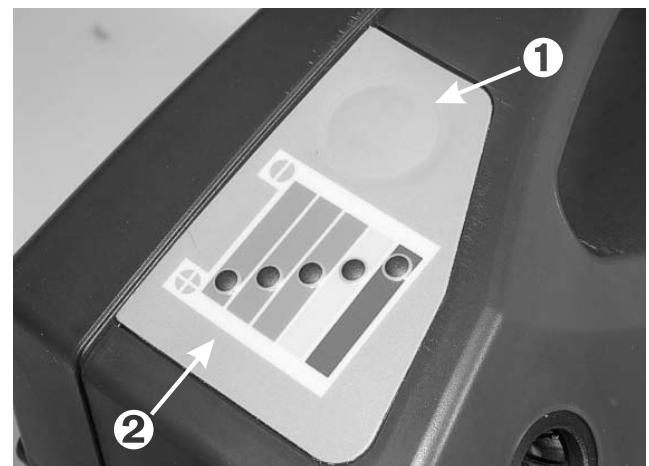
1.1.3 Driving unit

- ❶ = Battery pack
- ❷ = Control grip
- ❸ = Power switch
- ❹ = Driving unit's link to the wheelchair
- ❺ = Socket for power cable on the **V-max**
- ❻ = Control panel
- ❼ = Socket for power cable (out) and charging cable (in)



1.1.4 Control panel

- ❶ = Push button ON/OFF
- ❷ = Indicator of battery charge and malfunction



1.2 Technical data

Measurements	Height = 24 cm Width = 47.5 cm Depth = 18.5 cm
Weight	Driving unit, including grips = 8.5 kg Battery pack = 8,6 kg Power cable = 220 g Battery bag plus Velcro straps = 180 g Battery charger = 740 g
Margins for mounting the V-max to the wheelchair	Seat's width, minimum 36 cm / maximum negative camber: 5 %
Maximum permissible total weight	200 kg (person, wheelchair, V-max) *
Speed	continuously adjustable 6 km / per hour forward 3 km / per hour backward
Capacity with one battery pack	up to 15 km **
Maximum slope	up to 20 %
Batteries	2 x 12 V / 12 Ah
Direct current motor	24 V

* Limiting values stipulated by the wheelchair manufacturers must be noted and observed

** Range and climbing capacity depend on the weight of the person who is transported as well as on the floor surfaces, the ground, the terrain, etc.

Weight and climbing diagram:



In the interest of progress we reserve the right for technical changes.

1.3 Delivery package

The delivery package contains:

- ❶ = Wheelchair wheels including handrim and toothed ring
- ❷ = V-max driving unit plus pushing and control grip
- ❸ = Battery pack plus bag
- ❹ = Operator's manual
- ❺ = Charger plus operator's manual

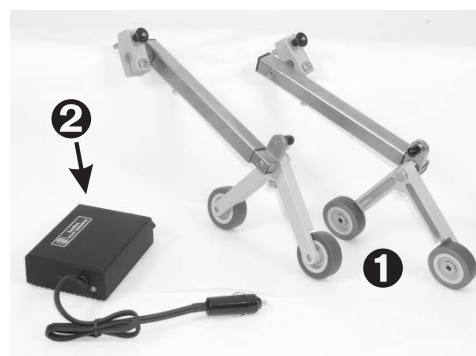
...as well as the components mounted to the wheelchair such as the bracket, power cable and the bag for the battery pack (no picture)

In addition a holding device is necessary, which is attached to the wheelchair beforehand.



1.4 Optional accessories

- ❶ = Anti-tilt support
- ❷ = Voltage transformer for the car



2 Assembly and Operation

The **V-max** can only be used in connection with a special bracket which must be mounted to your wheelchair.

This bracket may only be mounted by AAT or dealers authorized by AAT.

2.1 Brackets

All brackets are especially developed and adjusted to each individual wheelchair, which means that the bracket, **1** right, **2** left, pictured in this operator's manual may differ from the one attached to your wheelchair.



Before each use, check whether the bracket is securely fastened to the wheelchair. In case screws have loosened or fallen out you may not use the **V-max**. Please contact your dealer immediately.



2.2 Battery pack

A bag for the battery pack is attached under the seat of the wheelchair. Simply slide the battery pack into its bag...

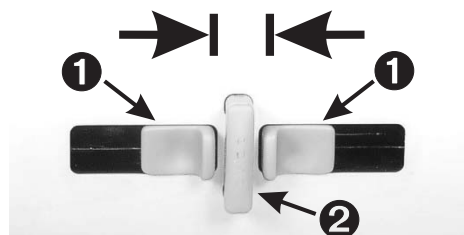


...and fix it with a Velcro strap.

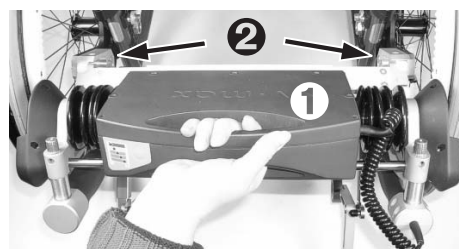


2.3 Hook on the V-max

To mount the **V-max** the powered axles must be inserted entirely. Press the two buttons **1** toward the PRESS button **2** until they lock. See picture on the right.

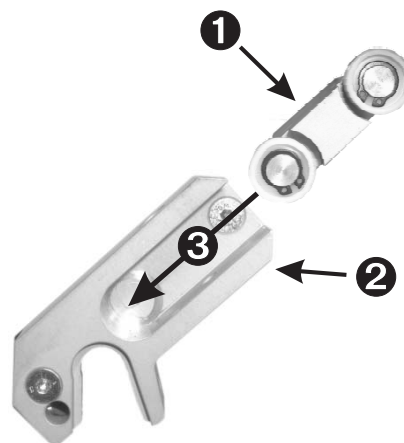


Now slide the **V-max** **1**, evenly, on both sides, into the brackets **2**.



Make sure the **V-max** with its wheelchair links **1** is in a straight line when you insert it into the brackets **2**.

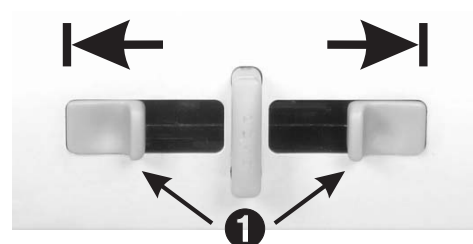
Then the machine slides automatically **3** into the appropriate place in the brackets.



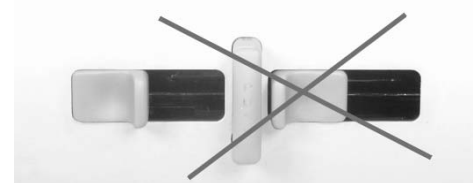
Now you press the PRESS button to unlock the levers and the powered axles come out.



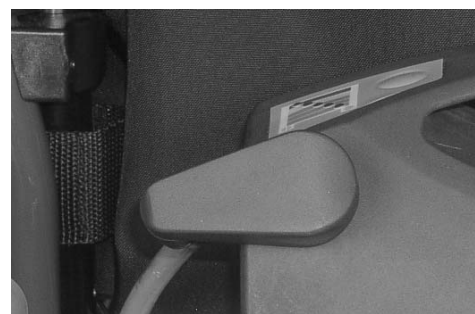
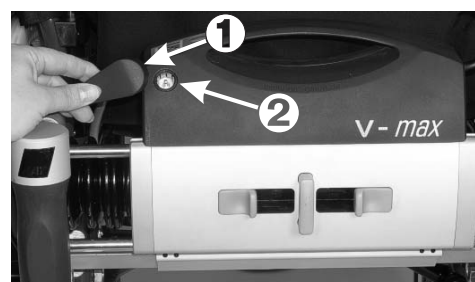
- ☞ The power unit is activated, if both buttons ❶ have reached their outer position.



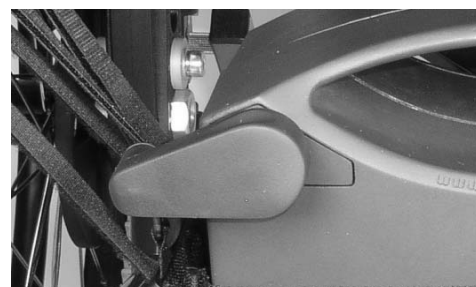
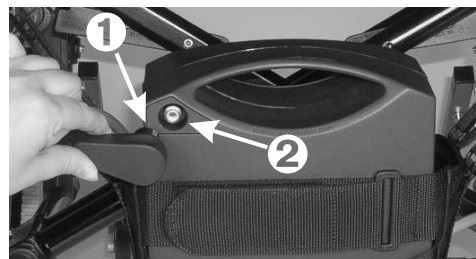
- ☞ The driving unit locked properly, if the wheelchair cannot be moved manually any more.



Now you can insert the plug ❶ of the power cable into its socket ❷ on the V-max.



Then you put the other plug **1** of the power cable into its socket **2** on the battery pack.



2.4 Pushing and control grip

The wheelchair driver's attendant controls all functions of the **V-max** by means of the control grip. Since the control grip **1** and the pushing grip **2** can be installed either on the right or the left side, the **V-max** is ideal for both right-handed or left-handed users.



At the ends of the regular wheelchair grips links are attached into which you can stick both grips of the **V-max** on either side. These particular grip holders allow the user to insert either one of the grips in various positions on the right or the left side, so an individual and comfortable adjustments of the grips is possible.



2.4.1 Attaching the grips

Due to the special toothing it is possible to insert the grips into the grip holders ❷ in the most comfortable position for each individual users.

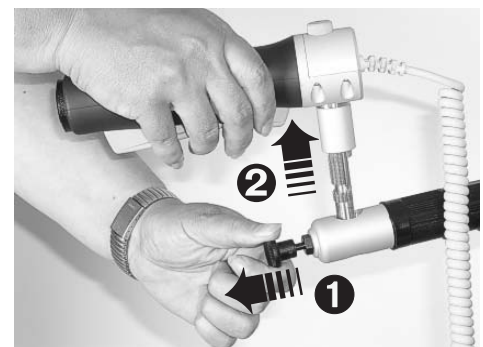


See picture on the right indicating the grip positions which have proven most comfortable for frequent use.

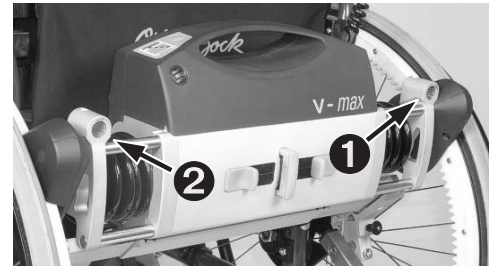


2.4.2 Removal of the grip

Pull the locating pin ❶. The grip ❷ unlocks and you can lift it out of the link.



In case you do not need the device for some time, simply remove the grips and put them back into their respective holders **1** and **2** on the **V-max**.



If you like, remove the **V-max** entirely from the wheelchair and set the device on its grips, which function as sturdy legs in such case.



2.5 Anti-tilt support

You may only use **V-max** if anti-tilt supports have been attached to your wheelchair.

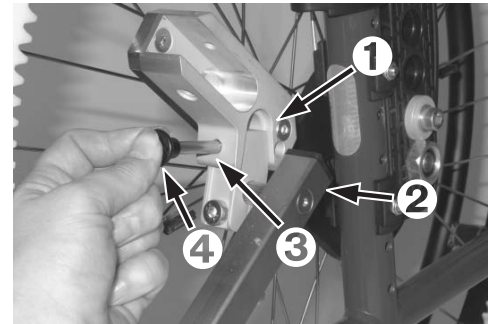
If your wheelchair is not equipped with anti-tilt supports, we offer them as an optional accessory with the **V-max**.

Particular fixtures **1** for these anti-tilt supports are already integrated into the brackets of the **V-max**.

2.5.1 Attaching and removing the tilt supports

Insert the anti-tilt support **2** entirely into the **V-max**'s bracket.

Then lock the anti-tilt support with the safety pin **3**. Slide the safety pin all the way into the hole drilled into the bracket while pressing the unlocking button **4** in the middle of the safety pin's head. Then release the unlocking button



- ☞ Always check whether the safety pins sit securely in the bracket. Make sure they cannot be removed without pressing the unlocking button.

2.5.2 Removing the anti-tilt supports

Press the unlocking button and keep it pressed to take out the safety pins. Now you can remove the anti-tilt supports.

3 Safety instructions and awareness of potential hazards

3.1 General information

All general rules for the safe use of a wheelchair apply without reservation while operating the **V-max**.

To assure the safe use of the **V-max**, it is indispensable to observe the following directions.

3.2 Technical requirements

Attaching the brackets of the **V-max** on the wheelchair or making changes on said brackets can only be performed by the company AAT Alber Antriebstechnik or their authorized dealers

The **V-max** may only be attached to wheelchairs whose seats measure at least 36 cm. All wheelchairs must be checked according to generally acknowledged technical norms, and their operators' manuals must be applied when using the **V-max**.

When operating the **V-max** all stipulations required by the wheelchair manufacturer, such as e.g. maximum gradient or maximum load, as well as all other general guidelines must be observed. Indicated limitations are not to be exceeded under any circumstances.

- ☞ The maximum total weight of 200 kg is composed of the weight of the person to be transported plus the weight of the wheelchair and the **V-max**.

3.3 Correct use / attendant

Thorough instruction into the use of the **V-max** by your dealer or a representative of AAT Alber Antriebstechnik is part of the delivery package and takes place at an appointment of your choice. This is a free service at no extra charge.

- ☞ Do not use the **V-max** without being trained to operate it.
- ☞ Only an attendant and not the wheelchair driver him- or herself may use the pushing and braking aid, **V-max**, because of the danger of tilting the wheelchair, especially when driving on slopes.
- ☞ In the interest of your safety the **V-max** may only be operated by people instructed in the use of the device and further by people who are physically and mentally capable to manage the **V-max** in all situations that may occur while using it.

The attendant must be able to catch the wheelchair plus the person sitting in it, if the chair should tilt backwards. Anti-tilt supports are obligatory!

- ☞ Should you feel insecure handling the **V-max**, please contact your dealer or one of the AAT representatives.

3.4 Environmental influences - electromagnetic compatibility

Electromagnetic compatibility signifies the capacity of an electric device to function satisfactorily in its electromagnetic environment without interfering with other devices that are also in said environment.

The **V-max** successfully passed all the EMV tests required by law.

3.5 Driving

Generally all limits of your wheelchair specified by the manufacturer must be observed and not exceeded.

- ☞ Always put your speed control in the position of its lowest possible speed when you start driving.

Although the **V-max** manages gradients up to 22 %, never exceed the maximum gradient stipulated by the manufacturer of your wheelchair.

- ☞ It is obligatory to use anti-tilt supports!
- ☞ Be careful when you drive downhill for quite some time with full batteries. Driving downhill generates electricity which charges the batteries additionally. This can lead to overvoltage. The **V-max** goes into coast and must be stopped manually or by means of the emergency switch. Please see chapter 4.1.3 Panic switch.

3.6 Special instructions for operation

If the **V-max** is turned off, the wheelchair cannot be moved manually - the driving unit is blocked-up.

In order to achieve the desired braking effect, you must turn on the **V-max**.

- ☞ The **V-max** can be stopped at any time - be it during regular operation, an emergency situation or when malfunctioning - by pushing and releasing the panic switch. Please turn to chapter 4.1.3 for further information on the panic switch.

4 Control and display elements

Your **V-max** is ready to go when you receive it. Once the **V-max** is correctly mounted and connected, you can turn it on and use it immediately.

Please practise using it with an empty wheelchair to get a feeling for the machine and its functions. This also applies to the panic switch system

4.1 Control grip

The wheelchair driver's attendant uses all of the **V-max**'s functions by means of the control grip.

4.1.1 Speed control

The speed control ❶ allows you to pre-select the speed.

- ☞ Turn the speed control counter-clockwise all the way for minimum speed.

You must begin with minimum speed when you use the **V-max** for the first time.

4.1.2 Rocker switch

With the rocker switch you determine the direction and speed (up to the pre-selected speed) of the **V-max**.

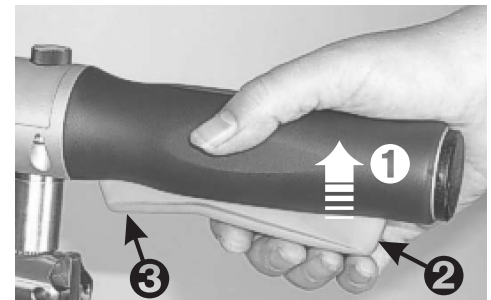
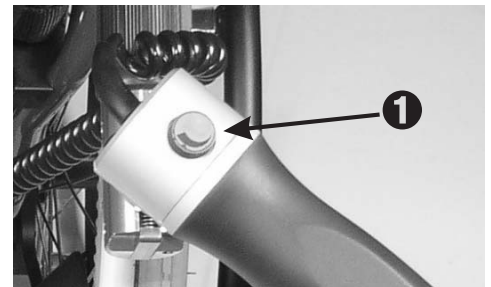
- ☞ Use the rocker switch ❶ carefully.

To drive forward, press the longer, back part ❷ of the rocker switch. To drive backward, press the shorter, front part ❸ of the rocker switch.

The **V-max** speeds up the more you press the rocker switch until you reach the maximum pressure point. It slows down the more you release the rocker switch.

If the user lets go of the rocking switch altogether and it reaches its neutral position, the power comes to a standstill. To increase the braking effect the power reverses poles.

Two seconds after standstill is reached, an electro-magnetic parking brake becomes active.



4.1.3 Panic switch

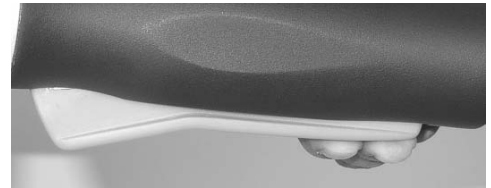
If during an emergency you press the rocker switch too hard so that the pressure point is overcome, the so-called panic switch causes the **V-max** to go from driving mode into coast. As long as you keep the rocker switch pressed, you can drive the patient away from the dangerous situation.

However, as soon as you release the rocker switch the electromagnetic brake is activated.

However, for safety reasons the electro-magnetic brake is activated immediately after releasing the rocker switch.

- ☞ Depending on the driving situation, the strong effect of the electro-magnetic brake may bring the wheelchair to an immediate, abrupt stop.

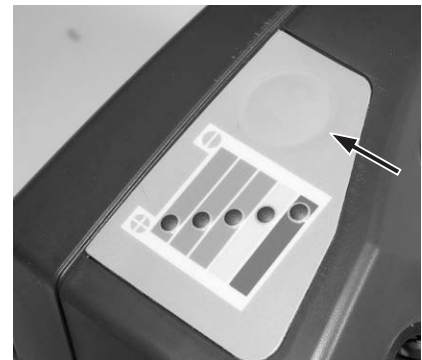
The panic switch works in both directions of driving, forwards and backwards.



4.2 ON/OFF push button

A number of LED's located on the control panel next to the On/Off button inform you about the charge of the battery.

If you have not used the **V-max** for longer than 5 minutes, it turns itself off automatically. In such case press the button again to reactivate the device.



4.3 Battery charge

A number of LED's located on the control panel next to the On/Off button inform you about the charge of the battery.

LED's and their meaning:

If the diode lights up in -

- the first green column: the battery pack is 100 % charged
- the second green column: the battery pack is 80 % charged
- the third green column: The abattery pack is 60 % charged
- the yellow column: the battery pack is 40 % charged
- the red column: the battery pack is 20 % charged

- ☞ If the LED in the red column lights up, you must recharge the battery pack.

Due to the extensive self tests of the electronics, it is possible that the charge indication only shows 80 %, even though the batteries are full. Please wait approximately one minute, then the charge will be indicated correctly.



5 Battery pack

The battery pack of the **V-max** is maintenance-free and rechargeable. Its durability depends directly on the number of charging/discharging cycles.

5.1 General information concerning the battery pack

If you take good care of your battery pack by recharging it regularly, you prolong its durability. The **V-max**'s electronics constantly check the battery's charge and thus prevent a total discharge, if used adequately.

- ☞ Avoid a total discharge of the battery pack. Recharge it after each partial discharge, i.e. after each use of the **V-max**.

The battery pack undergoes a so-called self-discharge; therefore, you should connect your battery pack, whenever possible, to a charger. The charging automatism, which switches from charging the battery to retaining the charge when it is full, kicks in and keeps the battery from overcharging.

If your battery pack has not reached its full capacity, it is possible that with a new battery pack it takes a few charging/discharging cycles to build up the full capacity.

The battery pack can be charged in any position. It is considered as safe as dry cells and admitted to air travel by DOT and IATA.

If fully charged batteries empty faster than usual, they are probably used up. In such case have your batteries checked by your local dealer and exchanged, if necessary.

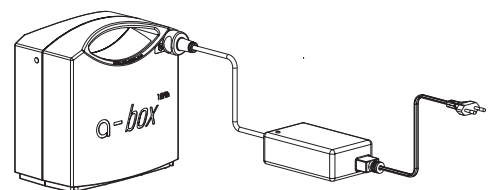
- ☞ Always charge your battery pack with the AAT charger delivered with your **V-max**. This particular charger automatically turns off when the batteries are fully charged keeping them from being overcharged.

5.1.1 Charging the batteries attached to the wheelchair

To charge the batteries you may leave the battery pack in its bag attached to the wheelchair. First pull the plug of the power cable, then insert the plug of the charger entirely into the charging socket. Finally plug the charger into the wall socket.

- ☞ During the charging process the LED display shows a constant red light.
- ☞ As soon as the charging process is finished, the LED display blinks red.

Afterwards you first remove the charger's plug from the wall socket, and then you pull the plug from the charging socket.

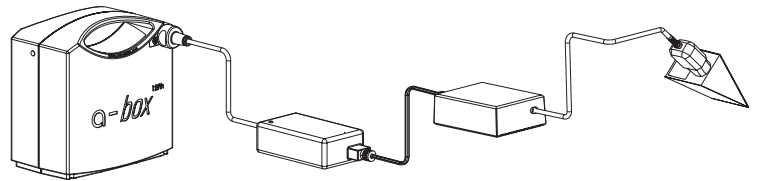


5.1.2 Charging the batteries in your vehicle

By means of a voltage transformer you may even charge your battery pack while driving your car.

First remove the power cable. Then fully insert the plug of the charger into the charging socket on the battery pack. Then connect the charger to the voltage transformer. Finally you plug the transformer into the cigarette lighter.

Afterwards you first pull the transformer's plug from the cigarette lighter before you disconnect it from the charger.



5.2 Change of fuses

The battery pack has two fuses, each 30 A, in a drawer ❶.

Once the lower fuse ❷ is burnt out, replace it by the upper, extra fuse ❸.

If a change of fuses is necessary, put a pin in the opening ❹ on the side of the battery pack. This unlocks the drawer, so you may pull it out.

☞ Always use the same 30 A fuses.



6 Trouble shooting - malfunction

If there are problems using the **V-max**, please check the following trouble shooting chart and see whether you can fix them yourself.

Problem	Check and potential solution
V-max cannot be turned on	Is the charger connected to the V-max ? If so, remove charging cable and connect the power cable
	Battery pack is empty? If so, charge the batteries
	Fuse is damaged? If so, exchange the fuse
	If the V-max still cannot be turned on, contact your local AAT dealer.
Batteries do not charge	Call your local AAT dealer

Malfunction is indicated by a blinking red light diode in the control field. Please turn the device OFF and ON again. If the device is still indicating malfunction, charge the batteries in case of low voltage. In all other cases, please contact your dealer.

Red LED blinks	Type of malfunction
1 x	Malfunction of the motor, the motor controller or the battery pack
2 x	Low voltage, batteries empty
3 x	Overvoltage
4 x	Electro-magnetic brake at fault
5 x	Electronics damaged
6 x	Electronics damaged

We purposely avoided the activation of the electro-magnetic brake as soon as the device recognizes a malfunction of some kind.



If you want to activate the electro-magnetic brake, push the rocker switch hard to overcome the pressure point and the panic switch is activated. Then release the rocker switch.

7 Care, maintenance and recycling

The **V-max** does not call for particular maintenance and, in contrast to the batteries, special care, except for occasional cleaning (see chapter 7.1.2), is not necessary.

7.1 Care

7.1.1 Battery pack

The **V-max**'s batteries are air-tight, maintenance-free, rechargeable and of excellent quality.

Total discharge leads to loss of capacity as well as a shorter durability.

-  Therefore avoid a total discharge by recharging the batteries whenever possible!
-  Charging and taking care of your batteries is the same thing in this case.

If fully charged batteries empty faster than usual, they presumably are used up. Have them checked by your local dealer or an AAT representative, and, if necessary, exchanged.

7.1.2 Cleaning

Please clean your control unit, driving unit, battery pack and brackets with a mild household cleaner.

-  Make sure that no water gets into the **V-max**; therefore, merely use a damp cloth for cleaning.
-  In the interest of your safety, do not use a high-pressure cleaning device.

7.2 Maintenance

The **V-max** is a device particularly low in maintenance. Nevertheless, for safety reasons your **V-max** needs to be checked once every 2 years, even though there may not be any malfunction or outer damage.

Please contact your dealer or your AAT representative concerning the maintenance work.

7.3 Disposal

Your **V-max** and its battery pack are products with a long durability. Once the device is old and out-dated, you may return it to AAT Alber Antriebs-technik GmbH or your local dealer for disposal.

8 Warranty and liability

8.1 Warranty

There is a 24 month warranty (6 months on the battery pack) on the **V-max** starting from the date of purchase. The warranty covers faulty material and manufacturing defects.

The warranty does not include:

- natural wear and tear
- damage caused by operation beyond set limitations
- damage caused by improper handling
- forced damage
- unauthorized changes made on the device and/or its accessories

8.2 Liability

Neither AAT Alber Antriebstechnik GmbH nor its agents or authorized dealers and sales representatives are liable for the safety, reliability or performance of the **V-max** or for any claims for personal injury or property damage which may arise from the following:

- the **V-max** was handled and used inappropriately
- the **V-max** was not checked every two years by an authorized dealer or AAT GmbH
- the **V-max** was used not in accordance with all instructions and precautions included in this user's manual.
- the **V-max** was used with insufficient battery charge
- assembly, repairs or other work was done by unauthorized personnel.
- parts or accessories other than those recommended by the manufacturer of the **V-max** were used
- parts of the **V-max** were changed or removed entirely



Ideen bewegen mehr

AAT Alber Antriebstechnik GmbH

Postfach 10 05 60 · D-72426 Albstadt

Tel.: 0 74 31 - 12 95 0 · Fax.: 0 74 31 - 12 95 35

Email: info@aat-online.de · www.aat-online.de